Vectors in R

 \mathbb{R} denotes the collection of all real numbers.

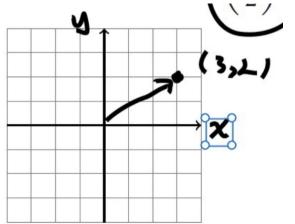
 $\mathbb{R}^1=\mathbb{R}$ is a number line

 \mathbb{R}^2 is a plain

 \mathbb{R}^3 is a 3-D space.

Vectors

Point (3,2) can be represented as the vector $\binom{3}{2}$



Vectors properties:

$$\vec{u} = \begin{pmatrix} u_1 \\ u_2 \end{pmatrix}, \quad \vec{v} = \begin{pmatrix} v_1 \\ v_2 \end{pmatrix}.$$

Vectors have the following properties.

1. Scalar Multiples:

$$c\vec{u} = \mathbb{C} \begin{pmatrix} u_1 \\ u_2 \end{pmatrix} = \begin{pmatrix} cu_1 \\ cu_2 \end{pmatrix}$$

2. Vector Addition:

$$\vec{u} + \vec{v} = \begin{pmatrix} u_1 \\ u_1 \end{pmatrix} + \begin{pmatrix} v_1 \\ v_2 \end{pmatrix} = \begin{pmatrix} u_1 + v_2 \\ v_1 + v_2 \end{pmatrix}$$